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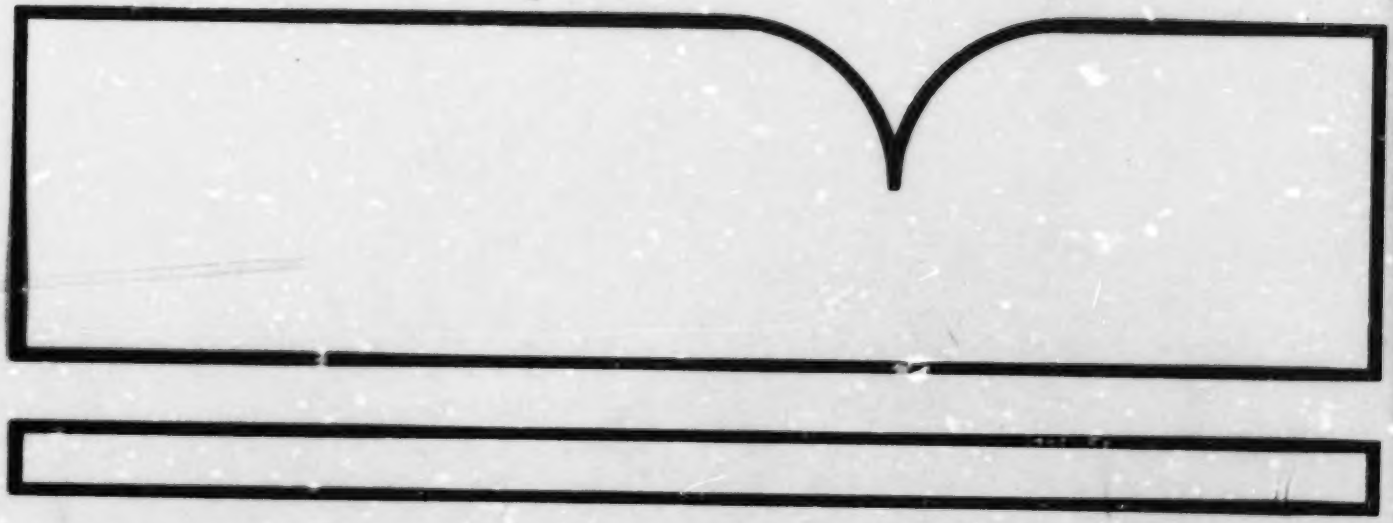

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In comparison to the other aquatic macroinvertebrate groups of Kansas, the leech fauna is an unusually neglected group. The early works of Verrill (1874), Moore (1898), Castle (1900), Harms (1959, 1960), and Klemm (1972b) have only included a few species. This preliminary survey of Kansas leeches include 20 species, 13 of which are new to this state. This inventory is not complete and additional records will undoubtedly be added to the list as the survey continues.

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KANSAS LEECHES (ANNELIDA: HIRUDINEA) WITH NOTES ON DISTRIBUTION AND ECOLOGY

by

Donald J. Klemm,[1] Donald G. Huggins, and Mark J. Wetzel[2]

In comparison to the other aquatic macroinvertebrate groups of Kansas, the leech fauna is an unusually neglected group. The early works of Verrill (1874), Moore (1898), Castle (1900), Harms (1959, 1960), and Klemm (1972b) have only included a few species.

This preliminary survey of Kansas leeches includes 20 species, 13 of which are new to this state (indicated by *). This inventory is not complete and additional records will undoubtedly be added to the list as the survey continues.

A literature survey indicates that knowledge of freshwater leeches is meager or lacking for most states, and that ecological and distributional data is particularly needed for all species. The readily available taxonomic keys of Moore (1959), Davies (1971), Klemm (1972b, 1976), Sawyer (1972), and Pennak (1978) have encouraged additional leech research and are useful in identifying most leech specimens to the species level. Individuals using these keys should be cautioned that these keys do not include all the presently known species and some lack the recent nomenclatural changes found in the literature. Leech systematics for North America have been currently examined by Sawyer (1972), Sawyer, et al. (1975), and Klemm (1976, 1977 and In Press). These studies help to clarify some of the problems in taxonomy and include important nomenclatural changes. In addition, Klemm (In Press) contains an improved taxonomic key, additional distribution records, and a synonomy for all the known North America species.

For ecological work the recent studies of Herrmann (1970) and Klemm (1972a) are most helpful, while Sawyer (1974) provides a comprehensive review of the ecology of freshwater leeches and their responses to different kinds of pollution.

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[1]Aquatic Biology Section, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

[2]Illinois Natural History Survey, 172 Natural Resources Building, Urbana, Illinois 61801.

Phylum Annelida

Class Hirudinea Lamarck, 1818

Order Rhynchobdellida Blanchard, 1867

Family Glossiphoniidae Vaillant, 1890

Batracobdella Viguier, 1879

**Batracobdella picta* (Verrill, 1872)

DONIPHAN Co.: Eagle Springs, 2 mi N & 0.5 mi E of Sparks, 23 May 1978, J. A. Slater.

This is a widely distributed species, common in some localities of the Great Lakes region and southern Canada and less common elsewhere. It is usually found in ponds and is often extremely abundant throughout the spring when it can be found free-living or parasitizing different species of adult and larval amphibians. This species plays an important role in the transmission of blood protozoans (*Trypanosoma* spp.) in amphibians.

Glossiphonia Johnson

**Glossiphonia complanata* (Linnaeus, 1758)

WALLACE Co.: unnamed creek, 13 mi N & 3.1 mi W Sharon Springs, 7 May 1976, P. M. Liechti.

This species is widespread across the northern half of the United States and throughout Canada; it is especially abundant in the Great Lakes region. The species is a predator of invertebrates and feeds predominantly on mollusks.

Helobdella R. Blanchard, 1896

**Helobdella elongata* (Castle, 1900)

RICE Co.: Little Arkansas River, 2.7 mi S & 1.5 mi E Little River, 9 Jun 1977, P. M. Liechti & D. G. Huggins.

This small species is uncommon but widely distributed in most of North America. Little is known about its natural history except that it has been reported to feed on insect larvae, aquatic oligochaetes, and various snails. Some of these reported prey items may be erroneous. Individuals are usually found in the detritus of benthic samples collected with various grab samplers.

**Helobdella stagnalis* (Linnaeus, 1758)

ATCHISON Co.: Muscotah Marsh near Muscotah, 3 May 1974, D. G. Huggins & J. Caldwell; N branch Independence Creek below Atchison State Lake, 25 May 1977, T. W. Oldham. CHEYENNE Co.: Spring Creek, 3.2 mi N & 0.2 mi E St. Francis, 18 May 1977, D. G. Huggins & P. M. Liechti. CLARK Co.: St. Jacob's Well, 15 Jul 1975, T. W. Edmonds. FORD Co.:

Ford Co. State Lake, 25 Jul 1974, S. Roth. JEWELL Co.: Jewell Co. State Lake, 4 Jul 1974, D. G. Huggins. NEMAHA Co.: Nemaha Co. State Lake, vicinity, 27 Jun 1974, T. W. Edmonds; Nemaha Co. State Lake, outfall stream, 23 May 1978, F. C. Gilbert, M. B. DuBois & J. A. Slater. SHERIDAN Co.: Sheridan Co. State Lake, outfall marsh, 6 May 1975, D. G. Huggins & J. Wagner. TREGO Co.: creek 0.5 mi NE Cedar Bluff Nat. Fish. Hatchery, 8 Aug 1977, T. W. Edmonds.

This species is abundant in the northern half of the United States and throughout Canada but appears to be less common in the southern United States. It preys on small oligochaetes, crustaceans, and aquatic insect larvae; it rarely feeds on snails. Various aspects of its life cycle can be found in Mann (1957), Tillman and Barnes (1973), and Davies and Reynoldson (1976).

**Helobdella triserialis* (E. Blanchard, 1849)
(=*H. lineata* (Verrill, 1874))

Bourbon, Chautauqua, Clark, Crawford, Elk, Ford, Greenwood, Jefferson, Kingman, Kiowa, Marion, Miami, Montgomery, Nemaha, Pawnee, Pratt, Scott, Sedgwick, and Shawnee counties.

This species is widely distributed and very abundant in some localities of North America. It feeds primarily on snails. Young of this species are often found parasitizing snails (Sarah, 1971; Klemm, 1975, 1976).

Placobdella Blanchard, 1893

Placobdella montifera Moore, 1906

JEFFERSON Co.: Big Slough Creek at Perry Lake, 9 Jun 1974, T. W. Edmonds.

This relatively uncommon species is widely scattered throughout North America but there are few records of its occurrence west of the Rocky Mountains. It usually occurs free-living or parasitizes fishes (Ryerson, Hoffman, 1967; Klemm, 1976). Harms (1959, 1960) collected it from the black bullhead (*Ictalurus melas*) in Kansas. Records of this species feeding on other aquatic animals are dubious and need further study. Klemm (1976), Curry and Vidrine (1976, 1977), and others have reported the leech from different species of clams. The association between this leech and clams has not as yet been shown to be chance occurrence, symbiotic, or parasitic.

**Placobdella multilineata* Moore, 1953

ALLEN Co.: oxbow lake, 4 mi S & 1 mi W Humboldt, US-169 Hwy, 11 Mar 1978, P. M. Liechti & D. G. Huggins. CHEROKEE Co.: Fly Creek, S32, T34S, R22E, 2 Jul 1974, G. Lessenden; Little Cherry Creek, 2.5 mi N Sherwin, 31 Jul 1975, T. W. Edmonds. MARION Co.: creek, 16.5 mi E Marion Co. Lake, 2 Jul 1975, T. W. Edmonds.

This species is especially common in the southern half of the United States while disjunct populations have been reported from some localities of the Midwest. It is a temporary parasite of many reptilian hosts in which heavy infestations have been found.

Placobdella ornata (Verrill, 1872)

Anderson, Atchison, Barton, Butler, Chautauqua, Clark, Coffey, Comanche, Dickinson, Douglas, Franklin, Gove, Hamilton, Harvey, Jefferson, Kingman, Labette, Linn, Lyon, Marion, Meade, Nemaha, Neosho, Ness, Ottawa, Phillips, Pottawatomie, Rawlins, Rice, Rooks, Saline, Scott, Sedgwick, Seward, Shawnee, Sheridan, Sherman, Sumner, Trego, and Wallace counties.

This species is abundant and widely distributed throughout northern United States especially the Great Lakes region and Canada but is less common in the southern states. Little is known about its feeding habits but it has been reported to feed on turtles. Records of this species parasitizing fish and birds are dubious and need further documentation. This species was first reported from Kansas by Castle (1900).

**Placobdella papillifera* (Verrill, 1872)

CHAUTAUQUA Co.: Big Chaney River, 1.5 mi W Elgin, 25 Jul 1974, T. W. Edmonds. LYON Co.: Verdigris River, S35, T21S, R10E, 25 Jul 1973, G. Lessenden. MEADE Co.: spring above Lake Meade, S21, T33S, R29W, 21 Jun 1973, J. Rickett & G. Lessenden. SEWARD Co.: Cimarron River, S35, T32S, R33W, 20 Jun 1973, G. Lessenden. TREGO Co.: Spring Creek below Cedar Bluff Res., 17 Jul 1975, P. M. Liechti.

This poorly known species is widely distributed in North America; it is very abundant in some areas but uncommon elsewhere. Little is known about its biology, and the only reported host is the musk turtle (*Sternothaerus odoratus*) (Sawyer, 1972).

Placobdella parasitica (Say, 1824)

Allen, Atchison, Barton, Butler, Chase, Cowley, Dickinson, Gray, Kearny, Labette, Linn, Marshall, Morris, Ottawa, Trego, Wabaunsee, and Woodson counties.

This species is widely distributed throughout the United States and southern Canada; it is abundant in the Great Lakes region but known only from a few western states. It is a temporary parasite on turtles where large numbers of this leech are often encountered. Published records of this species parasitizing fish are considered erroneous. Castle (1900) previously reported this species from Kansas.

Family Piscicolidae Johnston, 1865

Myzobdella Leidy, 1851
(=*Illinobdella* Meyer, 1940)

**Myzobdella lugubris* Leidy, 1851
(=*Illinobdella alba* Meyer, 1940; *I. elongata* Meyer, 1940; *I. moorei* Meyer, 1940; *I. richardsoni* Meyer, 1940; *Myzobdella moorei* (Meyer, 1940))

ELLIS Co.: Saline River at K-183 Hwy bridge, on catfish, 16 Jul 1976, T. W. Oldham.

This species is widely scattered throughout North America and in many localities is abundant. This fish leech has low host specificity and parasitizes many species of fishes. The leech is usually found

attached to the fins, inside the mouth and opercula, or especially the protected axial part of the pectoral fins of the host. Another favored place of attachment is the chin in ictalurid fishes. Specimens have been collected from fresh, estuarine, and marine waters (Sawyer, et al., 1975), and aspects of its biology are found in Daniels and Sawyer (1975). This species shows a great deal of variability in body shape.

Piscicolaria Meyer, 1940

Piscicolaria reducta Meyer, 1940

This species was not found during this study, but Harms (1959, 1960) reported it from the black bullhead (*Ictalurus melas*) and channel catfish (*Ictalurus punctatus*) in Kansas. This species is widely distributed east of the Rocky Mountains and is very common in some localities. It has low host specificity and is usually found parasitizing a variety of fish species. One of its favorite hosts in the Great Lakes region is the logperch (*Percina caprodes*). The most common site of attachment is the caudal fin, but other sites of attachment are the isthmus, mouth, and pectoral fins.

Order Gnathobdellida Vaillant, 1890

Family Hirudinidae Whitman, 1886

Haemopis Savigny, 1822

**Haemopis grandis* (Verrill, 1874)
(=*Mollibdella grandis*: Richardson, 1969)

KIOWA Co.: Rezeau Ranch spring fed pond #6, approx. 5.5 mi N & 0.5 mi E Belvidere, 25 Jul 1978, J. A. Slater, S. W. Hamilton & G. A. Schuster. RAWLINS Co.: spring run, 2.5 mi E & 1.2 mi N Herdon, D. G. Huggins & P. M. Liechti.

The distribution of this species is throughout most of North America, and it is fairly common in eastern United States and in Canada. It is especially common in the Great Lakes region which is considered its center of abundance. This jawless and toothless species is a predator and scavenger, and has never been known to suck blood. It feeds on aquatic mollusks, leeches, oligochaetes, insect larvae, and crustaceans.

Haemopis marmorata (Say, 1824) Moore, 1901
(=*Percymoorensis marmoratis*: Richardson, 1969)

LOGAN Co.: Smokey Hill River at US-83 Hwy bridge near Elkader, 8 May 1975, D. G. Huggins & J. Wagner. MEADE Co.: spring run, Meade State Lake area, 26 Apr 1972, D. G. Huggins. OTTAWA Co.: NW inlet stream, Ottawa Co. State Lake, 5 May 1976, D. G. Huggins. SCOTT Co.: spring-fed pool, Scott State Park and Lake, 14-15 Jul 1975, D. G. Huggins; pond, inlet end of Scott State Lake, 16 Jul 1975, D. G. Huggins. WALLACE Co.: Rose Creek, 2 mi W & 1.5 mi S of Wallace, 12 Jul 1977, S. W. Hamilton. WYANDOTTE Co.: Wyandotte Co. State Lake, 24 Apr 1976, G. A. Schuster.

This species is widely distributed in North American and is the one of the most frequently encountered hirudinid. Even though this species has jaws with distichous teeth, it is rarely a blood sucking parasite.

It is considered a predator and scavenger and has been reported to feed on oligochaetes, insect larvae, mollusks, dead fish, and other leeches. This amphibious leech may be found only partially submerged in water under large rocks and logs at the water edge. The only previous report of this species from Kansas is Moore (1898).

Haemopis terrestris (Forbes, 1890)
(=*H. lateralis* (Say, 1824)) (=*Percymoorensis lateralis*: Richardson, 1969)

Specimens of this species were not collected during this study. Klemm (1972b) reported it from Kansas based on one large specimen from Onaga and identified by J. P. Moore, United States National Museum (USNM 19075). This species is uncommon and has been collected from the southern Great Lakes region and Mississippi Basin, west to Colorado, and southward to the Gulf Coast states. It is usually overlooked of its terrestrial habits, occurring in damp soil, usually under rocks and logs and sometimes well away from water. An aquatic variety of this species reported by Moore (1912), Miller (1929), and Klemm (1972a) needs to be investigated. This species has jaws with distichous teeth but is considered a predator and scavenger and has not yet been reported to be a blood sucking parasite. It feeds on oligochaetes and other invertebrates.

Macrobdella Verrill, 1871

Macrobdella decora (Say, 1824)

This species was not collected during this study. However, Verrill (1874) reported it from a site on the Smoky Hill River in Kansas. Herrmann (1970) collected this species from one station in Colorado near the Kansas line and indicated that this might be the extreme western edge of this species range. Verrill's specimen is no longer available, but the specimen of Herrmann, if available, should be critically compared with the recently described species, *M. diplotertia*, for it may be found to be this species. *M. decora* is abundant in some localities of the Great Lakes region and in Canada and has been reported from most parts of central and eastern United States. It is usually found in temporary and permanent ponds, heavily vegetative marshes, and roadside ditches. This species is a predator, and its sanguivorous habits allow it to feed on a wide variety of vertebrates.

**Macrobdella diplotertia* Meyer, 1975

CHAUTAUQUA Co.: Big Caney River, 0.6 mi E Cedar Vale at US-166 Hwy bridge, 22 Apr 1976, D. G. Huggins. LINCOLN Co.: small pond, 1.5 mi E & 5 mi N Beverly, 6 Jul 1974, J. Caldwell & R. Hopp. SHERMAN Co.: Sherman Co. State Lake, outfall marsh area, 7 May 1975, D. G. Huggins & J. Wagner.

This leech was previously known only from Missouri (Meyer, 1975), thus these collections represent a considerable western range extension. Nothing is known concerning the biology of the species.

Order Pharyngobdellida Johnson, 1913

Family Erpobdellida

Erpobdella de Blainville, 1818

†*Erpobdella punctata punctata* (Leidy, 1870)
(=*E. p. annulata* Moore, 1922)

Cheyenne, Clark, Dickinson, Douglas, Gove, Graham, Jefferson, Leavenworth, McPherson, Nemaha, Rawlins, Riley, Scott, Sheridan, Sherman, Smith, Stafford, and Wallace counties.

This common species is widely distributed in North America, especially in the northern half of the United States and in Canada. It is less common in the southern United States. Some aspects of the li history, fecundity, behavior, and feeding habits, have been investigated (Sawyer, 1970). This leech is a predator and scavenger, feeding mainly on invertebrates. Sawyer (1971) reported that individuals sometimes serve as hosts for immature nematomorphs (*Gordius* sp.)

Mooreobdella Pawlowski, 1955

**Mooreobdella fervida* Verrill, 1871

COFFEY Co.: Long Creek near Burlington, 15 Mar 1974, D. G. Huggins & R. Moss; Neosho River, Kelly Park in Burlington, 14 Dec 1977, T. W. Oldham. BUTLER Co.: Walnut River, 2.0 mi W & 1.0 mi N Leon, 30 Jul 1975. FRANKLIN Co.: Marais des Cygnes River, 2 mi N Rantoul. 5 Apr 1974, D. G. Huggins. MONTGOMERY Co.: Montgomery Co. State Lake, 24 Jul 1974, R. Beer.

This species is widely distributed throughout the northern half of the United States; it is common in some localities of the Great Lakes region and in Canada. A predator and scavenger, it feeds mainly on aquatic oligochaetes, insect larvae, and crustaceans. Little is known about the biology of this species.

**Mooreobdela microstoma* (Moore, 1901)

Barber, Bourbon, Cherokee, Cheyenne, Crawford, Douglas, Ellsworth, Franklin, Harvey, Hodgeman, Kingman, Lyon, McPherson, Meade, Miami, Montgomery, Morris, Norton, Pottawatomie, Rawlins, Rice, Riley, Rooks, Seward, Wilson, and Wyandotte counties.

This species is common and widely distributed throughout the southern half of the United States and is less common in northern United States and southern Canada although it may be abundant in so localities. It is a predator and scavenger, and feeds on invertebrates. Sawyer (1971) reported that this species may serve as a host for juvenile nematomorphs.

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